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STATUS OF FLORISTIC STUDIES IN ARUNACHAL PRADESH

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Arunachal Pradesh formerly the North Eastern Frontier Agency, (N E F A) is the largest state in the north eastern region. This land of the dawning sun lies between 26° 30′ & 29° 28′ N and 91° 25′ & 97° 24′ E. Its five districts *viz.* Kameng, Subansiri, Siang, Lohit and Tirap with an area of 83,578 sq. km are located in hilly and mountainous terrain. On the northern and eastern sides, it touches the international boundaries of China and Burma respectively, on the south, it borders Assam and Nagaland and on the extreme west, Bhutan.

Its geographical location, climate and topography have all contributed to the characteristic vegetation and flora of the area. It is because of the botanical richness, that it has attracted many plant collectors like Booth, Nuttall, Griffith, Burkill, Bor, Biswas and Kingdonward even before the reorganisation of the Botanical Survey of India.

The vegetation can be broadly classified into the following types :

i) Tropical evergreen or Semi evergreen forests, ii) Sub-tropical forests. iii) Temperate forests and iv) Sub-alpine and Alpine vegetation.

i) *Tropical evergreen or Semi evergreen forests* : These forests are generally found in rain forests in the foot hills upto 1,000 m. The top canopy in these forests is represented by tall trees like *Altingia excelsa, Amoora wallichii, Artocarpus chaplasha, Bischofia javanica, Bombax ceiba, Callicarpa arborea, Castanopsis indica, Chukrasia tabularis, C. velutina, Cinnamomum cecicodaphne, Dillenia indica, Dipterocarpus gracilis, Duabanga sonneratioides, Dysoxylum procerum, Lagerstroemia speciosa, Magnolia campbellii, Pterospermum acerifolium, Çuercus glauca, Shorea assamica, Terminalia chebula, T. myriocarpa* and *Tetrameles nudiflora.*

The next canopy is represented by small trees and shrubs like *Abroma augusta, Ardisia humilis, A. undulata, Bauhinia purpurea, Boecia fulva, Boehmeria macrophylla, B. platyphylla, Buddleja asiatica, Capparis acutifolia* ssp. *sabiaefolia, Clerodendrum glandulosum, C. serratum, C. venosum, Coffea bengalensis, Dillenia indica, Ficus hispida, Illicium manipurense, Michelia doltsopa, Micromelum minutum, Mussaenda roxburghii, Oxyspora paniculata, Solanum torvum, Syzygium pseudoformosum* and *Talauma hodgsonni.* The canes like *Calamus erectus* and *C. leptospadix* occur in swamps and form impenetrable thickets. The tree ferns like *Cyathea* sp. and the large fern, *Angiopteris evecta* are also seen associated with *Pandanus furcatus.* The wild banana, *Musa balbisiana* is a conspicuous feature of these forests. The ground flora is poor, however, when the canopy is open, herbaceous species come up rapidly. The ground flora comprises of *Achyranthes bidentata, Alternanthera sessilis, Commelina paludosa, Murdannia nudiflora, Deeringia amaranthoides, Hedychium thyrsiforme, Impatiens paludosa, I. porrecta, I. radiata, Oxalis corniculata, Polygonum barbatum, P. serrulatum* and many species of ferns like *Asplenium*, and fern allies like *Equisetum* and *Selaginella*.

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The epiphytes include ferns, fern allies, orchids and members of the families Gesneriaceae and Zingiberaceae. Some of the common genera of orchids are *Bulbophyllum, Coelogyne, Cymbidium, Dendrobium, Eria, Oberonia* and *Pholidota*. The ground orchids are *Goodyria, Habenaria, Liparis, Malaxis* and *Phaius*. In shady, moist humus covered areas of the forest, on the roots of trees occasionally fleshy root parasite, *Balanophora dioica* may be seen. Some palms are also met within these forests.

(ii) *Sub-tropical forests* : These forests occur between 900 to 2,000 m and are dominated by *Actinodaphne obovata, Alnus nepalensis, Bauhinia variegata, Byttneria aspera, Callicarpa arborea, Castanopsis indica, Evodia fraxinifolia, Ficus gasparriniana, Garcinia acuminata, Gynocardia odorata, Kydia calycina, Magnolia pterocarpa, Prunus nepalensis, P. phaeosticta, Quercus glauca, Saurauia cerea, S. punduana, Schima wallichii, Stachyurus himalaicus* and *Sterculia indica*. Among the small trees the common ones are *Capparis multiflora, Photinia notoniana* and *Sapindus attenuatus*. The shrubs and undershrubs are *Agapetes auriculata, A. buxifolia, Artemisia vulgaris, Berberis wallichana, Camellia caduca, Cotoneaster bacillaris, Drymaria cordata, Eurya acuminata, E. japonica, Mahonia acanthifolia, M. nepalensis, Plectranthus ternifolius, P. undulata, Solanum verbascifolium, Sophora acuminata, Stellaria uliginosa, Tephrosia candida, Triumfetta pilosa, Urena lobata, Vernonia saligna, Vibernum foetidum* and *V. mullaha*. The common woody climbers are *Clematis acuminata, Holboelia latifolia* and *Tinospora malabarica*. Some of the straggling shrubs met within these forests are *Actinida callosa, Argyreia wallichii, Clematis gouriana, Dioscorea pentaphylla, Lygodium japonicum, Rubus cordifolia* and *Toddalia asiatica*. The herbaceous flora is represented by *Anaphalis adnata, A. arenosa, A. odorata, Campanula colorata, Cardamine hirsuta, Cynoglossum glochidiatum, Fragaria indica, Plantago major, Viola betonicifolia, V. diffusa, V. distans* and *V. serpens*. Some of the herbaceous climbers are like *Clitoria mariana, Parabaena sagittata, Pericampylus incanus* and *Stephania rotunda*. Biotic factors have resulted in clearing of forests and the sub-tropical Savannah lands make their appearance.

iii) *Temperate forests* : These are not so dense as the tropical evergreen or the sub-tropical forests, having an open appearance and with apparent storeyed nature. The dominant families represented here are Pinaceae, Ericaceae and Magnoliaceae. The Rhododendrons, Conifers and Oaks follow specific range of altitude. In the evergreen Oak forests (1,800-2,600 m) *Castanopsis indica* predominates upto 2,300 m and the common trees found are *Acer hookeri, A. oblongum, A. pectinatum* and *Symplocos spicata*. In the Rhododendron-Conifer forests *Lyonia ovalifolia, Magnolia campbellii, Quercus lamellosa, Rhododendron arboreum, R. campanulatum, R. lanatum* and *R. wightii* are seen. The shrubs are *Caryopteris wallichii, Debregeasia longifolia, Rubus ellipticus* and *Zanthoxylum armatum*. From 2,600 m upwards *Gaultheria fragrantissima, Rhododendron anthopogon, R. campanulatum, R. lanatum* and *Taxus baccata* are seen. On the north and eastern slopes in the coniferous forests, *Abies spectabilis, Cupressus* *torulosa* and *Tsuga dumosa* are seen. Among the herbs in temperate regions a few may be mentioned like *Gerbera pilloselloides, Polygonum molle, Rumex hastatus, Urtica parviflora, Verbascum thapsus* and *Viola patrinii.*

iv) *Sub-alpine and Alpine vegetation* : Sub-alpine vegetation occurs from 3,300-4,000 m. This type of vegetation is characterised by *Abies spectabilis, Cupressus torulosa, Juniperus recurva, Larix griffithiana, Pinus wallichiana, Rhododendron* spp. *Taxus baccata* and *Tsuga dumosa.* Among the shrubs the common ones are *Berberis asiatica, B. wallichiana, Eurya acuminata, Gaultheria fragrantissima, Photinia notoniana* and *Vaccinium venosum.* The Alpine vegetation occurs above 4,000 m and upto 5,500 m in altitude. There the tree species are generally replaced by shrubby Rhododendrons and herbaceous plants like species of *Primula, Polygonum, Saussurea, Sedum, Saxifraga,* etc.

From 1955 to 1977 the Botanical Survey of India with its Eastern Circle headquarters at Shillong has organised twenty five collection tours to different places of Arunachal Pradesh.

The flora comprises of about 3,000 species belonging to 1,155 genera and 188 families, including many economic plants, such as medicinal, aromatic, fibre and pulp yielding, timber plants, as also orchids, rare, endangered and primitive plants.

Medicinal plants : *Abies spectabilis, Abroma augusta, Aconitum laeve, A. novuluridum, Accrus calamus, Artemisia nilagirica, Asparagus filicinus, Berberis nepalensis, Caltha palustris, Costus speciosus, Datura stramonium, Dioscorea deltoidea, Diploknema butyracea, Embelia ribes, Gaultheria fragrantissima, Holarrhena antidysenterica, Lycopodium clavatum, Lyonia ovalifolia, Nardostachys jatamansi, Paederia foetida, Phyllanthus emblica, Podophyllum hexandrum, Rauvolfia serpentina, Skimmia laureola, Solanum khasianum, Stephania hernandifolia, Swertia chirayita, Valeriana hardwickii* and *Zanthoxylum acanthopodium.*

Timber plants : *Abies spectabilis, Dillenia indica,. Engelhardtia spicata, Juglans regia, Michelia doltsopa, Pinus wallichiana* and *Quercus griffithii.*

Paper pulp yielding plants : *Daphne bholua* and different species of *bamboos.*

Orchids : Orchids are represented by several species of the genera *Aerides, Bulbophyllum, Calanthe, Coelogyne, Cymbidium, Dendrobium, Eria, Habenaria, Liparis, Oberonia, Phaius* and *Pholidota.*

Primitive plants : A number of primitive flowering plants are found in Eastern Himalayas. Some examples are species of *Alnus, Aspidocarya, Betula, Decaisnea, Euptelea, Exbucklandia, Haematocarpus, Holboellia, Houttuynia, Magnolia, Mangelietia, Pycnarrhena* and *Tetracentron.*

About seventy research papers have been published on the plants of Arunachal Pradesh. (Rolla S. Rao 1972).

REFERENCE

ROLLA. S. RAO. Botanical Survey work in Arunachal—*Arunachal Research Bull.* (Independence Silver Jubilee Issue) : 49-76. 1972.